

I/we claim:

1. A coupling apparatus comprising:
 - a receiving element defining an axial bore having an annular groove;
 - a retaining ring supported in the annular groove;
 - an insertion element having a radially extending projection for engaging the retaining ring in the annular groove;
 - the insertion element being axially inserted into the axial bore, at least partially passing through the retaining ring and the radially extending projection being received in the annular groove; and
 - wherein the receiving element and the insertion element are rotated relative to one another and the radially extending projection is biased by the retaining ring to cause an end of the insertion element to bear on an inner surface in the axial bore of the receiving element.
2. The coupling apparatus as set forth in claim 1, wherein the retaining ring comprises an inner circumference having a notch to allow passage of the radially extending projection past the retaining ring to be received in the annular groove.
3. The coupling apparatus as set forth in claim 2, wherein the retaining ring forms a helical spring seated in the annular groove to axially bias the radially extending projection.
4. The coupling apparatus as set forth in claim 3, wherein the helical spring provides an increasingly biased engagement between the receiving element and the insertion element as the receiving element and the insertion element are rotated radially relative to one another.
5. The coupling apparatus as set forth in claim 4, wherein the retaining ring comprises a knee portion and an opposing tab portion spaced from the knee portion which springably biases an engagement arm of the retaining ring across an axial width of the annular groove to form the helical spring.

6. A coupling apparatus for joining a pipe and a fitting along a central axis, the coupling apparatus comprising:

a male portion formed on the pipe and a female portion formed on the other of the pipe and the fitting;

the male portion comprising an outer surface supporting a first projection and a second projection extending substantially perpendicular from the outer surface;

the female portion having an axial bore defined by an inner wall about the main axis, and an annular groove formed in the inner wall;

a retaining split ring supported in the annular groove of the female portion, the retaining split ring comprising a first arm and a second arm being joined to one another at respective first ends, and the first and second arms having respective spaced apart second ends;

a first notch provided in the first arm and a second notch provided in the second arm of the retaining split ring permit passage of the first and second projections of the male portion past the retaining split ring and into the annular groove in the female element whereupon relative rotation between the male and female portions rotates the first and second projections in the annular groove and forces the first and second projections against the first and second arms of the split ring to bias an end of the male portion against a surface of the inner wall of the female portion.

7. The coupling apparatus as set forth in claim 6 wherein the retaining ring further comprises a bent portion which connects the respective first ends of the first and second arms and separates the first and second arms of the retaining split ring into adjacent substantially parallel first and second planes.

8. The coupling apparatus as set forth in claim 7 wherein the second ends of the first and second arms have a respective first and second tab portion, the first tab portion extending perpendicular from the second end of the first arm and the second tab portion extending perpendicular from the second end of the second arm.

9. The coupling apparatus as set forth in claim 8 wherein the annular groove supporting the split ring is provided with a first and second wall, the first tab portion biasing a portion of the first arm away from the first wall, and the second tab portion biasing a portion of the second arm away from the second wall of the groove.

10. The coupling apparatus as set forth in claim 9 wherein the biased portions of the first and second arms define axially biasing ramps between the bent portion of the retaining ring and the first and second tab portion in the annular groove.

11. The coupling apparatus as set forth in claim 10 wherein the first and second projections of the male portion pass through the first and second notches in the retaining split ring and into the annular groove and upon relative radial rotation between the male and female portions the first and second projections are forced along the axially biasing ramps in the annular groove to securely couple the male and female portions to one another.

12. A method of coupling a pipe and a fitting together the method comprising the steps of:

- providing the fitting with a receiving element defining an axial bore having an annular groove;

- inserting a retaining ring into the annular groove;

- providing the pipe with an insertion element having a radially extending projection for engaging in the annular groove;

- axially inserting the insertion element into the axial bore, at least partially passing through the retaining ring and the radially extending projection being received in the annular groove; and

- rotating the receiving element and the insertion element relative to one another contact the radially extending projection against the retaining ring and bias an end of the insertion element to bear on an inner surface in the axial bore of the receiving element.